clear water. Skirted the ice for two days. Position at noon of May 7, N. 45° 30′, W. 48° 01′; at 8 p. m. on the same day in N. 45° 0′, W. 48° 30′, were obliged to stop the engines for eight hours, being beset by the ice. Got clear of it finally on the 8th in N. 44° 0′, W. 49° 20′.

7th.—S. S. "Colina,', in N. 45° 40′, W. 47° 44′, at noon, in clear water; 1.30 p. m., weather foggy, steamed into straggling ice and bergs of various sizes; 2 p. m., dense fog and ice becoming heavy; had again to steer to the se., to get clear water.

8th.—Bark "Maggie L. Carvill," in N. 43° 50′, W. 48° 40′, saw large quantities of medium-sized icebergs and countless small pieces of ice, weather foggy; steered southward for one hundred miles to clear ice; bark "Linden" in N. 45° 00′, W. 49° 00′, at 10 a. m., encountered field-ice and bergs and continued to pass them until May 9th, in N. 43° 00′, W. 51° 00′. Had to steer sse. about ten miles to clear a sheet of field-ice; s. s. "Colina," in 44° 10′, W. 50° 49′, passed through a quantity of floe ice; s. s. "Jersey City," from N. 43° 37′, W. 49° 54′, at 5 a. m, to N. 43° 25′, W. 50° 37′, at 8 a. m., passed innumerable small pieces of ice.

9th.—Bark "Hassel," in N. 46° 50′, W. 45° 10′, at 2 p. m., passed an iceberg about thirty feet high; sailed in thick fog until May 10th, in N. 45° 45′, W. 47° 20′, when we saw thirty bergs, ranging from twenty to one hundred feet high. On May 11th, in N. 44° 29′, W. 50° 18′, weather clear, passed more than two hundred large icebergs and much small ice, reached clear water in N. 44° 19′, W. 51° 00′; bark "Brilliant," in N. 45° 50′, W. 48° 46′, sighted numerous icebergs and ran into field-ice and remained fast for six hours, afterward sailed nw. by n. for one hundred and twenty miles along field-ice, and at 4 a. m. on the 11th, in N. 46° 05′, W. 50° 25′, got clear of ice; s. s. "Titania," at 1.30 a. m., ran into a field of ice and stopped for daylight, 4 a. m., began to force a passage through the ice; 7 a. m., ice becoming thicker, forced a passage through heavy field-ice until 4 p. m., dense fog all the time; at 10.30 p. m., had to stop engines until 2 a. m. the next morning. Ship's position at noon N. 48° 28′, W. 49° 37′.

10th.—The s. s. "Colina" encountered large quantities of field and straggling ice in the Gulf of Saint Lawrence and remained fast for nine hours, after which we got clear and proceeded on our voyage; s. s. "Titania," at 10.30 a. m., off Cape Race, passed several detached bergs and continued to pass occasional icebergs, some of them very large, until midnight.

11th.—Bark "Speranza," in N. 41° 41′, W. 47° 40′, passed one large iceberg, and, in N. 41° 40′, W. 48° 10′, passed one large and one small berg; s. s. "Titania," in N. 47° 35′ W. 59° 37′, at noon; from 4 p. m. till midnight, passed through quantities of scattered field-ice.

12th.—Bark "Speranza," in N. 41° 38′, W. 49° 40′ passed a large iceberg.

13th.—Ship "Columbia," in N. 41° 39′, W. 51° 00′, at 8 a. m., passed an iceberg two hundred and fifty feet high; from this position to N. 41° 35′, W. 52° 50′, saw seven large icebergs, ranging from forty to one hundred and fifty feet high, and a number of small pieces. Temperature of the air varying from 60° to 50° when nearing the bergs; temperature of water falling from 50° to 30° when passing them. The s. s. "Suffolk," in N. 47° 0′, W. 46° 0′, had alternately foggy and clear weather; saw a great number of very large icebergs and some small ice. Our progress was greatly impeded up to May 15th when we sighted the last twelve bergs in N. 45° 20′, W. 50° 38′; approaching the Gulf of Saint Lawrence the weather cleared and we passed quantities of small ice to the northwest of Bird Rocks. Ship "Rence," in N. 42° 0′, W. 50° 0′, saw an iceberg three-quarters of a mile long and one hundred and fifty feet high.

14th.—Ship "Rence," in N. 41° 20′, W. 53° 00′, passed ten bergs of various sizes; thick fog prevailing.

17th.—S. S. "India," in N. 41° 44′, W. 48° 12′, at 4 p. m. saw a large iceberg about sixty feet high and about three hundred feet long; at the same time saw a small berg about four miles to the northward.

18th.—S. S. "Galileo," in N. 42° 49′, W. 47° 15′, passed a medium-sized iceberg

21st.—S. S. "Westphalia," in N. 41° 41′, W. 49° 58′, at 1.15 p. m. passed an iceberg about two hundred feet high and five hundred feet long.

23d.—S. S. "Surrey," in N. 43° 34′, W. 48° 44′, at 10.30 p. m. passed the first iceberg about one hundred feet high and two hundred feet long; passed innumerable bergs until 3.30 a. m. of the 24th, when several icebergs of various sizes were seen between N. 43° 16′, W. 50° 1′, and N. 43° 4′, W. 50° 46′.

24th.—S. S. "Werra," in N. 41° 30′, W. 48° 27′, at 4 a. m. saw two icebergs, each about one hundred feet high and three hundred feet long; in N. 41° 30′, W. 49° 25′, at 6 a. m. saw nine bergs of various sizes, and in N. 41° 42′, W. 50° 56′, at noon saw one large berg about two hundred feet high.

26th.—S. S. "Suevia," in N. 44° 12′, W. 43° 24′, at 1.05 p. m. passed a large berg about eighty feet high and one thousand feet long, and in N. 44° 8′, W. 43° 34′, passed a medium-sized berg.

SIGNAL SERVICE AGENCIES.

Signal Service agencies have been established in the Maritime Exchange buildings at New York and Philadelphia and in the Custom-house at Boston, where the necessary blanks and other information will be furnished to shipmasters. In the January REVIEW was published an explanation of the object of these agencies.

In pursuance of the arrangements made with the meteorological office of London, England, there were, during May, 1885, sixteen reports cabled to that office from New York, concerning storms and icebergs encountered by vessels on the Atlantic west of the forty-fifth meridian. Three messages were sent from the agency at Boston.

TEMPERATURE OF THE AIR.

[*Expressed in degrees, Fahrenheit.*]

The distribution of mean temperature over the United States and Canada is exhibited on chart ii. by the dotted isothermal lines; and in the table of miscellaneous meteorological data are given the means for the various stations of the Signal Service.

In the following table are given the mean temperatures for the several geographical districts with the normals and departures, as deduced from the Signal Service observations:

Average temperatures for May, 1885.

Districts.	Average for May. Signal-Service observations.		Comparison of May, 1885, with the average for several years.
	For several years.	For 1885.	
	°	°	°
New England	54.9	53.1	— 1.8
Middle Atlantic states	61.5	59.3	— 2.2
South Atlantic states	70.0	69.1	— 0.9
Florida peninsula	76.7	75.8	— 0.9
Eastern Gulf states	72.6	70.2	— 2.4
Western Gulf states	73.3	71.2	— 2.1
Rio Grande valley	80.1	76.2	— 3.9
Tennessee	68.9	65.8	— 3.1
Ohio valley	65.0	62.6	— 2.4
Lower lake region	57.2	55.5	— 1.7
Upper lake region	51.3	48.5	— 2.8
Extreme northwest	52.4	51.7	— 0.7
Upper Mississippi valley	62.7	60.1	— 2.6
Missouri valley	59.2	58.1	— 1.1
Northern slope	52.4	52.1	— 0.3
Middle slope	59.6	56.8	— 2.8
Southern slope	70.8	66.4	— 4.4
Southern plateau	66.6	66.1	— 0.5
Middle plateau	55.2	55.8	+ 0.6
Northern plateau	56.8	58.4	+ 1.6
North Pacific coast region	55.0	57.6	+ 2.6
Middle Pacific coast region	59.2	61.2	+ 2.0
South Pacific coast region	66.6	68.3	+ 1.7
Mount Washington, N. H	33.5	36.1	+ 2.6
Pike's Peak, Colo	21.9	21.1	— 0.8

The mean temperature, as shown in the table of averages for the several districts, has been below the normal in every

district east of the Rocky mountains, and above the normal in the northern plateau and on the Pacific coast.

In the table of miscellaneous meteorological data are given the means and departures for the several stations, and on chart iv. the departures are exhibited by lines connecting stations of equal departure.

Although the temperature for the various districts east of the Rocky mountains has averaged below the normal, yet at a few stations, viz., in northern New England, along the south Atlantic coast, and at Pittsburg, Pennsylvania, it has been normal or slightly above.

On the summit of Mount Washington, New Hampshire, the mean temperature was 2°.6 above the May normal for the last thirteen years, and at Eastport, Maine, and Pittsburg, Pennsylvania, it was 0°.2 and 0°.3 above normals deduced from records covering twelve and fourteen years, respectively. At Hatteras and Wilmington, North Carolina, very slight departures above the normal are shown, and at Portland, Maine, Fort Macon, North Carolina, and Charleston, South Carolina, the mean temperatures coincide with their respective normals.

At Huron, Dakota, and West Las Animas, Colorado, the mean temperature, as shown in the table, was slightly above the normal, while the means at neighboring stations were decidedly below. This is due to the short records from which the normals are deduced at Huron and West Las Animas, as the observations at these stations cover a shorter period than those at the other stations.

The regions of greatest departure below the normal temperature comprise portions of Tennessee, Ohio and Illinois, and an area extending from the Rio Grande valley northward to western Nebraska and southeastern Wyoming.

In the northern plateau and on the Pacific coast the month has been warmer than the average May, the departures above the normal temperatures varying from 1° to 4°.

RANGES OF TEMPERATURE.

The monthly, and greatest and least daily ranges of temperature for the Signal Service stations will be found in the table of miscellaneous meteorological data. The monthly ranges were greatest in the upper lake region, upper Mississippi and Missouri valleys, and in the Rocky mountain districts; they were least at the stations on the Atlantic, Pacific, and Gulf coasts. The extreme monthly ranges are: least, 17°.5 at Tatoosh Island, Washington Territory; 20°.4 at Key West, Florida; 20°.9 at San Diego, California; 23°.8 at Cape Mendocino, California, and 24°.5 at Pensacola, Florida. The greatest are 78°.0 at Phœnix, Arizona; 68°.9, 67°.0 and 66°.9, respectively, at Forts Custer, Benton and Maginnis, Montana.

DEVIATIONS FROM MEAN TEMPERATURE.

The departures exhibited by the reports from the regular Signal Service stations are shown in the table of average temperatures for the several geographical districts; in the table of miscellaneous meteorological data, and on chart iv. The following notes in connection with this subject are reported by voluntary observers:

Arkansas.—Lead Hill, Boone county: mean temperature, 67°.1, is 1°.4 above the May average for the three preceding years.

Dakota.—Webster, Day county: mean temperature, 57°.5, is 3° above the May average for the two preceding years.

Georgia.—Milledgeville,: mean temperature, 69°.9, is about the May normal.

Illinois.—Anna, Union county: mean temperature, 64°.2, is 2°.7 below the May average for the last ten years.

Mattoon, Coles county: mean temperature, 62°.0, is 4° below May average for the last five years.

Sycamore, DeKalb county: mean temperature, 54°.2, corresponds to the May normal.

Riley, McHenry county: mean temperature, 54°.4, is 2°.5 below the May average for the last twenty-four years: the mean temperature for the spring months of 1885 is 40°.5, or 3°.3 below the normal for the above period; only the spring of 1867 was colder.

Swanwick, Perry county: mean temperature, 63°.2 is 0°.1 below the May average for the last four years.

Collinsville, Madison county: mean temperature, 62°.2, is 4° below the May average.

Indiana.—Vevay, Switzerland county: mean temperature, 63°.8, is 1°.6 below the average for the last twenty-one years.

Logansport, Cass county: mean temperature, 61°.4, is 2°.6 below the May average for the last twenty-six years.

Wabash, Wabash county: mean temperature, 58°.7, is 0°.4 below the May average for the last nine years.

Spiceland, Henry county: mean temperature, 60°.1, is 1°.2 below the May average for the last thirty-one years.

Kansas.—Independence, Montgomery county: mean temperature, 63°.2, is 2°.8 below the May average for the last thirteen years.

Wellington, Sumner county: mean temperature, 64°.4, is 0°.2 above the May average for the last seven years.

Yates Centre, Woodson county: mean temperature, 62°.0, is 1°.4 below the May average for the last five years.

Topeka, Shawnee county: mean temperature, 61°.8, is slightly lower than the normal for May.

Emporia, Lyon county: mean temperature, 62°.1, is 0°.6 below the May normal.

Lawrence, Douglas county: mean temperature, 62°.8, is 2°.9 below the May normal for the last eighteen years.

Maine.—Gardiner, Kennebec county: mean temperature, 51°9, is 1°.5 below the May average for the last forty-seven years.

Maryland.—Fallston, Harford county: mean temperature, 59°.1, is 1°.8 below the May average for the last fourteen years.

Massachusetts.—Somerset, Bristol county: mean temperature, 56°.6, is 2°.3 below the May normal.

Worcester, Worcester county: May is the ninth consecutive month for which the mean temperature has been below the normal. In but two of the last forty-seven years has the mean temperature for May been lower than that (52°.4) for 1885, viz: in 1850 and 1852.

New Hampshire.—Contoocook, Merrimac county: mean temperature, 57°.5, is 1° below the May average for the last fourteen years.

New Jersey.—South Orange, Essex county: mean temperature, 57°.3, is the lowest recorded during the last fifteen years with two exceptions, viz: 1882 and 1884. The mean temperature for the spring season, 44°.7, is 2°.5 below the spring average and is the lowest for the above period.

Nevada.—Carson City: mean temperature, 58°.8, is 2°.1 above the May average.

New York.—Palermo, Oswego county: mean temperature, 53°.9, is 2°.4 below the May average for the last thirty-two years. The mean temperature for the spring season, 40°.3, is 4°.3 below the spring average for the same period.

North Volney, Oswego county: mean temperature, 54°.9, is 0°.2 below the May normal for the last eighteen years. The mean temperature for the spring season, 37°.6, is 3°.8 below the spring normal and is the lowest for the above period. The warmest spring occurred in 1878, the mean temperature being 47°.4

Ohio.—Wauseon, Fulton county: mean temperature, 56°.9, is 1°.9 below the May average for the last fifteen years. The mean temperature for the spring months (March, April and May) is 42°.2, or 3°.7 below the spring average for the above period.

Texas.—New Ulm, Austin county: mean temperature, 72°.0, is 2°.4 below the May average for the last thirteen years.

Vermont.—Woodstock, Windsor county: mean temperature, 54°.8, is 0°.7 above the May average for the last eighteen years.

Virginia.—Wytheville, Wythe county: mean temperature, 60°.5, is 0°.4 below the May normal for a period of twenty-two years.

Bird's Nest, Northampton county: mean temperature, 67°.0, is 2° above the May average for the last seventeen years.

Variety Mills, Nelson county: mean temperature, 62°.5, is 1°.3 below the May average for the last eight years.

Dale Enterprise, Rockingham county: mean temperature, 64°.6, is 0°.8 above the May average for the last five years,

West Virginia.—Helvetia, Randolph county: mean temperature, 56°.4, is 1°.8 below the May average for the last nine years.

Wisconsin.—Beloit, Rock county: mean temperature, 55°.6, is 2°.7 below the May average for the last thirty-six years.

FROSTS.

Frosts occurred in the several states and territories during May, 1885, on the following dates:

Arkansas.—Mount Ida, 10th; Lead Hill, 8th, 9th, 10th.

Colorado.—Denver, 6th, 7th, 8th, 11th; Pike's Peak, 2d, 3d, 4th, 7th, 8th, 9th, 20th, 27th; Montrose, 1st, 19th, 24th, 25th; Fort Lewis, 11th.

Connecticut.—New Haven, 4th, 5th, 10th, 12th; New London, 4th; Hartford, 4th, 12th.

Dakota.—Fort Totten, 9th, 16th, 17th; Fort Buford, 3d, 6th

Table of comparative maximum temperatures for the month of May.

State or Territory.	Maximum for May, 1885, Signal Service.		Maximum since Signal-Service stations were opened—3 to 14 years.			Highest from any other source.			
	Station.	Temperature.	Station.	Temperature.	Year.	Place.	Temperature.	Year.	Length of record.
		°		°			°		Years.
Alabama	Montgomery	88.8	Montgomery	98	1875	Mount Vernon Arsenal	102		34
Do	Mobile	86.4	Mobile	98	1878	Mobile	92		34
Arizona	Prescott	90 5	Prescott	90	1878	Fort Verde	111		12
Do	Yuma	110.0	Yuma	108.7	1883	Fort Mojave	110		11
Arkansas	Fort Smith	86.3	Fort Smith	93.3	1883	Fort Smith	93		21
Do	Little Rock	89.2	Little Rock	91	1880	Little Rock	87		28
California	San Francisco	77.0	San Francisco	86	1883	Benicia Barracks	95		25
Do	San Diego	73.4	San Diego	94	1879	San Diego	96		17
Colorado	Denver	80.0	Denver	92	1874	Fort Lyon	99	1880	23
Do	Pike's Peak	38.7	Pike's Peak	47	1880	Fort Garland	93		22
Connecticut	New Haven	82.2	New Haven	89	1880	New Haven	93		86
Do	New London	80.3	New London	89	1881	Fort Trumbull	92		48
Dakota	Fort Buford	84.1	Fort Buford	95	1880	Fort Abercrombie	102		19
Do	Yankton	85.6	Yankton	94	1880	Fort Randall	101		24
Delaware	Cape Henlopen	82.0	Delaware Breakwater	89	1880	Fort Delaware	91		45
District of Columbia	Washington City	86.4	Washington City	96	1880	Washington City	96		49
Florida	Pensacola	86.2	Pensacola	93	1881	Fort Barrancas	93		53
Do	Key West	90.8	Key West	93.2	1881	Key West	95		44
Georgia	Savannah	90.6	Savannah	98	1878	Savannah	97		37
Do	Augusta	91.9	Augusta	100	1878	Augusta Arsenal	96		49
Idaho	Lewiston	86.8	Lewiston	92	1884	Fort Lapwai	101		18
Do	Boisé City	86.8	Boisé City	88	1881	Fort Boise	95		11
Illinois	Chicago	80.4	Chicago	89	1874	Chicago	98		38
Do	Cairo	89.3	Cairo	92	1874	Mattoon	98	1876	2
Indiana	Indianapolis	87.7	Indianapolis	89	1881	Vevay	98		21
Indian Territory	Fort Sill	87.0	Fort Sill	97	1880	Fort Arbuckle	100		20
Do	Fort Reno	90.4	Fort Gibson	94	1874, 1880	Fort Gibson	99		47
Iowa	Dubuque	86.0	Dubuque	94	1874	Dubuque	91		11
Do	Des Moines	91.6	Des Moines	93	1880	Muscatine	90		27
Kansas	Leavenworth	88.0	Leavenworth	94	1874, 1875	Fort Leavenworth	94		44
Do	Dodge City	84.0	Dodge City	98	1879, 1880	Fort Riley	99		23
Kentucky	Louisville	87.4	Louisville	93	1881	Newport Barracks	90		29
Louisiana	Shreveport	92.0	Shreveport	101	1875	Baton Rouge	99		56
Do	New Orleans	87.0	New Orleans	92	1877	New Orleans	96		51
Maine	Portland	81.6	Portland	94	1880	Portland	93		37
Do	Eastport	72.6	Eastport	80	1877	Brunswick	98		58
Maryland	Baltimore	82.1	Baltimore	95	1881	Baltimore	90		37
Massachusetts	Boston	64.4	Boston	97	1880	Williamstown	95		60
Do			Springfield	94	1880	New Bedford	90		58
Michigan	Detroit	80.0	Detroit	90.5	1881	Detroit	94		38
Do	Alpena	78.3	Alpena	91	1874	Fort Brady	92		52
Minnesota	Saint Paul	87.1	Saint Paul	94	1874	Fort Snelling	92		55
Do	Moorhead	85.3	Moorhead	88	1881	Fort Ripley	101		16
Mississippi	Vicksburg		Vicksburg	95	1874, 1877	Vicksburg	95		4
Missouri	Saint Louis	91.0	Saint Louis	93	1874	Saint Louis	97	1878	40
Montana	Fort Benton	89.1	Fort Benton	93	1875	Fort Benton	94		5
Do	Fort Shaw	85.2	Fort Shaw	84	1881	Fort Shaw	98		13
Nebraska	North Platte	85.2	North Platte	94	1880	Fort McPherson	100	1879	12
Do	Omaha	80.5	Omaha	92	1880	Fort Calhoun	98		5
Nevada	Winnemucca	86.4	Winnemucca	86	1881, 1882	Camp Halleck	104		7
New Hampshire	Mount Washington	61.9	Mount Washington	62	1879, 1880	Auburn	90	1881	5
New Jersey	Sandy Hook	83.1	Sandy Hook	93	1880	New Lisbon	101	1880	1
Do	Cape May	76.8	Cape May	81	1874, 1880	New Brunswick	98	1880	5
New Mexico	Lava	92.0	La Mesilla	101	1879, 1881	Fort McRae	109		11
Do	Santa Fé	77.0	Santa Fé	89	1872	Santa Fé	92		25
New York	Albany	86.1	Albany	92	1880	Albany	93		55
Do	Rochester	85.3	Rochester	90	1879	Rochester	89		40
North Carolina	Wilmington	87.9	Wilmington	95	1878	Fort Macon	93		16
Do	Kitty Hawk	86.6	Kitty Hawk	93	1880	Fort Johnson	92		55
Ohio	Cincinnati	84.1	Cincinnati	94	1874, 1875	Cincinnati	96	1877, 1881	42
Do	Cleveland	80.6	Cleveland	92	1879	Marietta	94		53
Oregon	Portland	94.0	Portland	90	1884	Fort Dalles	96		15
Do	Roseburg	88.7	Roseburg	88.2	1884	Fort Hoskins	95		8
Pennsylvania	Philadelphia	84.3	Philadelphia	96	1880	Philadelphia	98	1880	120
Do	Pittsburg	87.1	Pittsburg	95	1881	Allegheny Arsenal	96		31
Rhode Island	Block Island	75.8	Newport	85.2	1881	Providence	91		35
South Carolina	Charleston	90.2	Charleston	94	1878	Charleston	94		105
Tennessee	Memphis	90.2	Memphis	90	1879	Humboldt	98		4
Do	Knoxville	85.2	Knoxville	94	1877	Ashwood	96	1879	3
Texas	Rio Grande City	98.0	Rio Grande City	112	1879	Fort Ringgold	123	1879	32
Do	Fort Stockton	99.0	Fort Stockton	104	1879	Fort Stockton	111		15
Utah	Salt Lake City	83.8	Salt Lake City	91	1876	Fort Douglas	91		16
Vermont			Burlington	91	1880	Charlotte	96	1878	7
Virginia	Lynchburg	85.5	Lynchburg	96	1881	Alexandria	96		12
Do	Norfolk	84.4	Norfolk	98	1880	Fortress Monroe	91		49
Washington Territory	Olympia	77.7	Olympia	87	1878, 1884	Fort Walla Walla	99		14
Do	Dayton	86.6	Dayton	90	1880	Fort Vancouver	98		19
West Virginia			Morgantown	91	1875	Weston	100	1877	2
Wisconsin	Milwaukee	80.4	Milwaukee	90	1874	Milwaukee	91		11
Do	La Crosse	85.7	La Crosse	96	1874	Embarras	98		14
Wyoming	Cheyenne	79.1	Cheyenne	88	1874	Fort Laramie	98		27

to 12th; Huron, 9th; Yankton, 2d, 7th to 10th, 12th; Deadwood, 6th to 9th, 11th; Webster, 2d, 6th to 10th, 26th, 27th, 30th.

Georgia.—Milledgeville: reported in valleys on the 11th.

Idaho.—Boisé City, 17th, 23d; Albion, 22d, 23d, 24th.

Illinois.—Chicago, 9th, 10th, 11th; Springfield, 10th; Cairo, 8th, 9th, 10th; Anna and Swanwick, 8th; Rockford, 1st, 2d, 4th, 7th, 9th, 10th, 11th; Mattoon and Charleston, 8th, 10th; Riley, 2d, 4th, 7th to 11th; Sycamore, 2d, 3d, 7th to 10th.

Indiana.—Indianapolis, 2d, 10th; Spiceland, 2d, 3d, 10th; Logansport and Wabash, 3d; Guilford, 3d, 8th, 10th; Sunman, 3d, 4th, 8th, 10th; Vevay, 7th to 11th; Greencastle, 8th; Jeffersonville, 10th, 11th.

Iowa.—Davenport, 1st, 6th to 10th; Monticello, 1st, 2d, 4th, 6th to 11th, 19th; West Union, 1st, 4th, 7th, 9th, 10th, 11th; Cedar Rapids, 1st to 4th, 7th, 9th, 10th, 11th; Muscatine, 1st, 7th, 8th, 9th; Maynard, 1st, 2d, 9th, 10th, 11th, 19th; Des Moines, 2d, 7th, 9th, 10th; Cresco, 2d, 4th, 6th, 8th to 11th, 19th; Oscaloosa, 6th to 11th; Dubuque and Manchester, 7th, 9th, 10th, 11th; Keokuk, 7th, 10th; Fort Madison, 7th; Ottumwa, 7th, 8th; Independence, 7th, 9th; Guttenberg, 8th.

Kansas.—Concordia and Westmoreland, 2d, 7th to 10th; Allison, 2d, 7th to 10th, 12th, 25th; Topeka, 7th; Clay Centre, 7th, 8th, 9th; Leavenworth, 7th to 10th; Manhattan, 8th, 9th, 10th; Wyandotte, 8th, 10th; Dodge City, 9th, 10th, 12th; Independence and Yates Centre, 9th, 10th; Emporia and Wellington, 10th; Maud, 10th, 12th.

Kentucky.—Frankfort, 11th.

Maine.—Gardiner, 1st to 6th, 11th, 12th; Cornish, 3d, 4th; Waterville, 5th; Bangor, 5th, 6th, 11th, 12th, 28th.

Maryland.—Fallston, 10th, 12th.

Massachusetts.—Princeton, 3d; Fall River, 3d, 4th, 27th; Rowe, 3d, 4th, 10th, 12th; Deerfield, 3d, 4th, 5th, 11th, 12th; Somerset, 4th, 11th, 12th; Taunton, 4th, 12th; Amherst, 10th, 11th, 12th; Worcester, 29th.

Michigan.—Escanaba, 1st to 13th, 18th, 19th, 20th, 28th; Grand Haven, 1st, 2d, 6th, 11th, 13th; Alpena, 1st, 3d, 10th to 13th; Thornville, 1st to 4th, 8th to 11th; Marquette, 2d, 6th, 19th, 28th; Port Huron, 2d, 3d; Mackinaw City, 2d, 11th, 12th; Manistique, 2d, 3d, 11th; Birmingham, 2d, 11th; Ann Arbor, 3d, 4th, 11th; Lansing, 10th; Northport and Moorestown, 11th, 12th, 13th; Hudson, 11th, 19th, 20th, 23d.

Minnesota.—Saint Vincent, 1st, 2d, 3d, 5th, 6th, 9th, 17th; Duluth, 2d, 5th, 10th, 11th; Moorhead, 2d, 3d, 5th, 9th, 10th, 11th, 17th; Northfield, 2d, 6th to 10th, 19th; Chester, 2d, 4th, 6th to 13th, 19th; Saint Paul, 9th, 10th.

Missouri.—Saint Louis, 8th; Lamar, 8th, 9th, 10th; Carthage and Springfield, 8th, 10th.

Montana.—Poplar River, 2d, 3d, 8th to 12th, 17th, 24th; Fort Maginnis, 6th, 7th, 8th, 10th; Fort Shaw, 6th, 7th, 9th to 12th; Fort Assinaboine, 6th, 7th, 10th; Helena, 11th, 21st.

Nebraska.—Fairbury, 2d; Omaha, 2d, 9th, 10th; Tecumseh, 2d, 6th, 7th, 8th; Madison, 2d, 7th to 10th, 12th; Genoa, 2d, 7th, 8th, 9th; Harvard, 4th, 5th, 10th; Fremont, 6th to 10th; Crete and De Soto, 7th to 10th; Stockham, 7th, 8th; Yutan, 7th, 9th, 10th; North Platte, 12th.

Nevada.—Carson City, 13th to 18th, 21st to 24th; Winnemucca, 14th, 15th, 17th, 18th, 22d, 23d.

New Hampshire.—Mount Washington, 2d, 8th to 12th; Antrim, 3d, 4th, 6th.

New Jersey.—Dover, 4th, 9th to 12th; Somerville, 9th to 12th; Readington, 9th, 10th, 12th; Sandy Hook and Salem, 12th.

New Mexico.—Santa Fé, 6th, 11th, 14th.

New York.—Palermo, 1st to 5th, 12th; Albany, 2d, 3d, 4th; Menand Station, (near Albany), 2d, 5th, 11th; Oswego, 2d, 3d, 12th, 28th; North Volney, 2d, 3d, 12th; Buffalo, 3d; Rochester, 3d, 11th, 12th; Plattsburg Barracks, 3d, 5th, 10th; Cooperstown and Mountainville, 3d, 4th, 5th, 9th, 12th; Humphrey, 3d, 11th, 15th; LeRoy and Ithaca, 12th; Auburn, 12th, 13th.

North Carolina.—Statesville, 11th; Blackwell, 11th, 16th.

Ohio.—Ruggles and Yellow Springs, 1st, 2d, 3d, 10th; Cleveland, 2d, 3d; North Lewisburg, 2d, 10th, 11th; Garrettsville, 2d, 3d, 11th; Jefferson, 3d; Toledo, 3d, 10th; Wauseon, 3d, 4th, 10th, 11th, 13th; Hiram, 3d, 7th; Tiffin, 3d, 11th; Portsmouth, 4th; Columbus, 8th; Cincinnati, 8th, 9th; Westerville, 11th, 14th.

Oregon.—Fort Klamath, 18th, 24th, 27th.

Pennsylvania.—Quakertown, 1st, 2d, 3d, 5th, 9th to 12th; Erie, 2d; Dyberry, 2d to 5th, 9th to 12th; Wellsboro, 2d to 5th, 9th, 10th, 12th; Wysox, 3d, 9th, 12th; Catawissa, 3d, 5th, 8th, 12th; Grampian Hills, 5th, 9th, 12th; Blooming Grove, 9th; Fallsington, 9th, 31st.

Rhode Island.—Point Judith, 3d, 4th, 5th, 11th, 12th; Narragansett Pier, 11th.

South Carolina.—Pacolet, 11th.

Tennessee.—Ashwood, 3d, 10th, 11th, 12th; Austin, 3d, 9th, 10th; Nashville, 8th, 10th; Memphis, 9th, 10th; Milan, 10th; Chattanooga, 11th.

Utah.—Nephi, 6th, 15th, 16th, 19th, 23d, 24th; Salt Lake City, 16th, 24th.

Vermont.—Newport, 1st to 4th, 9th; Woodstock, 3d, 4th, 10th, 28th, 29th.

Virginia.—Marion, 4th, 9th, 10th, 11th; Dale Enterprise, 8th to 11th; Variety Mills and Wytheville, 9th, 11th; Lynchburg and Snowville, 11th; Bird's Nest, 12th.

Washington Territory.—Dayton, 9th.

West Virginia.—Helvetia, 3d, 5th, 9th.

Wisconsin.—La Crosse, 1st, 2d, 4th, 7th to 11th, 19th; Neillsville, 1st to 4th, 6th to 12th, 19th, 20th; Embarras, 1st to 4th, 7th, 11th, 19th; Wausau, 1st to 11th, 18th, 19th; Beloit, 1st, 7th; Milwaukee and Sussex, 2d, 11th; Franklin, 11th.

Wyoming.—Cheyenne, 1st to 4th, 6th to 9th, 11th, 12th, 15th, 19th, 25th; Fort Bridger, 11th, 27th.

The following reports of injury to vegetation by frost have been received:

La Crosse, Wisconsin: the temperature fell to 29°.5 on the 7th, being the lowest with one exception, viz.: on May 2d, 1875, (29°), that has been recorded in May since the establishment of this station.

Janesville, Rock county, Wisconsin: the temperature fell to 28° on the 7th, and ice one-fourth inch in thickness formed. The tobacco plants were seriously injured.

Burlington, Iowa: on the morning of the 7th the temperature fell to 30°; small fruits were injured.

Des Moines, Iowa: the frost on the 7th caused injury to fruit and the growing crops.

Davenport, Iowa: the temperature fell to 29°.3 on the morning of the 7th; this is the lowest temperature recorded in May during the last thirteen years. Plants and fruits were injured.

Cairo, Illinois: early vegetables were damaged by the frosts on the 8th and 9th.

Huron, Dakota: the buds of trees and garden vegetables froze on the 8th and 9th; on the morning of the latter date the temperature fell to 25°.3.

Concordia, Kansas: nearly all of the early crops were blighted by the frosts on the 7th and 8th. The temperature fell to 31° on the latter date.

Lynchburg, Virginia: reports from southwestern Virginia state that there was a heavy frost on the morning of the 11th, which caused considerable damage.

Winnemucca, Nevada: on the morning of the 23d, ice formed to a thickness of one-fourth of an inch; potatoes and other vegetables were killed.

ICE.

Ice formed in the various states and territories during May, as follows:

Idaho.—Albion, 24th.

Illinois.—Riley, 7th; Sycamore, 26th.

Iowa.—Independence, Cedar Rapids, Dubuque, Davenport, and Des Moines, 7th; Oscaloosa, 6th to 10th; Cresco, 2d, 4th, 9th, 10th, 11th; Muscatine, 7th, 8th, 9th.

Kansas.—Westmoreland, 8th; Concordia, 7th, 8th.
Maine.—Eastport and Bangor, 3d.
Massachusetts.—Princeton, 3d; Rowe and Fall River, 3d, 4th; Amherst, 4th.
Michigan.—Northport, 12th, 13th; Birmingham, 2d; Moorestown, 11th; Escanaba, 2d, 3d, 6th; Mackinaw City, 3d, 6th.
Minnesota.—Saint Paul, 7th, 9th.
Missouri.—Lamar, 8th.
Nebraska.—Yutan, 7th to 0th; Stockham, 7th; Genoa, 2d, 7th.
Nevada.—Winnemucca, 23d.
New Jersey.—Somerville, 9th, 11th.
New York.—Menand Station, (near Albany) 3d, 4th; Albany, 4th; Humphrey 3d, 11th.
Ohio.—Garrettsville and Ruggles, 2d, 3d; North Lewisburg, 8th.
Pennsylvania.—Fallsington, 12th; Catawissa, 13th.
Rhode Island.—Point Judith, 3d, 4th.
Utah.—Nephi, 16th, 24th.
Vermont.—Strafford, 1st, 3d, 4th, 10th, 12th.
Wisconsin—La Crosse, 7th to 11th; Milwaukee and Embarras, 7th; Franklin, 11th.
Wyoming.—Fort Bridger, 24th.

PRECIPITATION.

[*Expressed in inches and hundredths.*]

The distribution of rainfall over the United States and Canada, for the month of May, 1885, as determined from reports from more than eight hundred stations, is exhibited on chart iii.

In the following table are shown, for each of the several geographical districts, the normal May precipitation for a series of years, the average for May, 1885, and the excess or deficiency as compared with the normal:

Average precipitation for May, 1885.

Districts.	Average for May. Signal-Service observations.		Comparison of May, 1885, with the average for several years.
	For several years.	For 1885.	
	Inches.	*Inches*	*Inches.*
New England	3.70	3.51	—0.19
Middle Atlantic states	2.88	3.99	+1.11
South Atlantic states	3.52	6.34	+2.82
Florida peninsula	3.15	4.67	—1.52
Eastern Gulf states	4.45	5.05	+0.60
Western Gulf states	5.39	5.07	—0.32
Rio Grande valley	2.88	8.72	+5.84
Tennessee	3.80	4.93	+1.13
Ohio valley	3.90	3.70	—0.20
Lower lake region	3.25	3.96	+0.71
Upper lake region	3.57	2.40	—1.17
Extreme northwest	3.06	1.47	—1.59
Upper Mississippi valley	4.43	2.48	—1.95
Missouri valley	3.99	4.10	+0.11
Northern slope	2.43	1.40	—1.03
Middle slope	4.09	4.51	+0.42
Southern slope	3.12	3.19	+0.07
Southern plateau	0.40	0.55	+0.15
Middle plateau	1.52	1.76	+0.24
Northern plateau	1.50	2.67	+1.17
North Pacific coast region	2.23	3.48	+1.25
Middle Pacific coast region	0.92	0.32	—0.60
South Pacific coast region	0.35	0.22	—0.13
Mount Washington, N. H.	6.85	2.29	—4.56
Pike's Peak, Colo.	4.01	6.12	+2.11

The precipitation has been in excess of the May average in the lower lake region, upper Ohio valley, Tennessee, middle and south Atlantic, and east Gulf states, portions of Kansas and Nebraska, and over an area extending from the west Gulf coast to the north Pacific coast region.

The excess has been most marked on the Atlantic coast from Florida to Virginia, in the north Pacific coast region, and in the northern plateau, where the departures are from one and one-fourth to nearly three inches, and in the Rio Grande valley, where the excess amounts to 5.84 inches.

In the upper lake region, extreme northwest, northern slope, upper Mississippi and lower Ohio valleys, Missouri, Arkansas, northeastern Texas, northern Louisiana, California, Arizona, and portions of New England and the middle Atlantic states, the precipitation has been below the average.

The most marked deficiencies occurred in the upper lake region, upper Mississippi valley, extreme northwest, and northern slope, where they varied from one to two inches.

At Milwaukee, Wisconsin, the monthly precipitation was 0.41, the May average for the last fourteen years being 3.65; at Des Moines, Iowa, there was a deficiency of 4.47, as compared with the average for the last six years.

The meteorological record forwarded by the post surgeon at Fort Ellis, Montana, shows the rainfall for May to have been remarkably heavy at that place; rain fell on eighteen days during the month, aggregating 12.26.

In the table of miscellaneous meteorological data are given the rainfalls at the various Signal Service stations with the departures from the respective normals.

DEVIATIONS FROM AVERAGE PRECIPITATION.

The departures exhibited by the reports from the regular Signal Service stations, are shown in the table of average precipitation for the several geographical districts, and also in the table of miscellaneous meteorological data. The following notes in connection with this subject are reported by voluntary observers:

Arkansas.—Lead Hill, Boone county: monthly precipitation, 3.73, is 4.48 below the May average for the three preceding years.

Georgia.—Milledgeville: monthly precipitation, 6.69, is 3.36 in excess of the May average.

Illinois.—Anna, Union county: monthly precipitation, 2.24, is 2.46 below the May average for the last ten years.

Mattoon, Coles county: monthly precipitation, 6.38, is 1.51 above the May average for the last five years.

Sycamore, DeKalb county: monthly precipitation, 1.65, is 3.11 below the May average for the four preceding years.

Riley, McHenry county: monthly precipitation, 1.72, is 1.70 below the May average for the last twenty-four years. The precipitation for the spring of 1885, is 5.98, or 2.72 below the spring average, and is the least for the above period.

Collinsville, Madison county: monthly precipitation, 2.56, is 2.16 below the May average.

Swanwick, Perry county: monthly precipitation, 4.26. is 0.04 below the May average for the last four years.

Indiana.—Vevay, Switzerland county: monthly precipitation, 2.47, is 1.06 below the May average for the last twenty-one years.

Logansport, Cass county: monthly precipitation, 5.02, is 0.80 in excess of the May average for the last twenty-six years.

Wabash, Wabash county: monthly precipitation, 4.56, is 0.28 above the May average for the last nine years.

Spiceland, Henry county: monthly precipitation, 3.73, is 0.14 above the May average for the last twenty-six years.

Kansas.—Independence, Montgomery county: monthly precipitation, 5.62, is 1.15 above the May average for the last thirteen years.

Wellington, Sumner county: monthly precipitation, 7.19, is 1.46 above the May average for the last seven years.

Yates Centre, Woodson county: monthly precipitation, 4.68, is 0.91 below the May average for the last five years. The precipitation for the spring season is 11.21, or 2.61 above the spring average.

Emporia, Lyon county: monthly precipitation, 4.18, is 0.43 below the May average.

Lawrence, Douglas county: monthly precipitation, 4.07, is 0.18 below the May average for the last eighteen years. The total precipitation for the first five months of 1885, is 13.44, or 1.38 in excess of the average for the corresponding months during the above period.

Maine.—Gardiner, Kennebec county: monthly precipitation, 3.41, (1.44 inches fell on the 31st,) is 0.50 below the May average for a period of forty-seven years.